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ABSTRACT

Two years ago, the University of Wisconsin system, the state legislature, and a number of businesses combined resources and provided funds to support regional and local projects to develop self-sustaining professional development models. Through a grant from the University of Wisconsin Extension PK-16 Initiative, a regional consortium of preservice teachers, K-12 educators, Cooperative Education Service Agencies' staff, and university teacher educators was established. The grant is in its second year and was redesigned to meet the needs of a broader range of K-12 teachers, preservice teachers, and teacher educators. This paper discusses the historical context of the Virtual Learning Technology Community (VLTC) project, supporting staff development in rural schools in through virtual communities, and evaluation of the VLTC. (Author/MES)

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The Virtual Learning Technology Community: Creating and Sustaining Professional Development for K-16 Learning Communities.

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Abstract: Two years ago, the University of Wisconsin System, the state legislature and a number of businesses combined resources and provided funds to support regional and local projects to develop self-sustaining professional development models. Through a grant form the University of Wisconsin Extension PK-16 Initiative, a regional consortium of preservice teachers, K-12 educators, Cooperative Education Service Agencies' staff (CESA), and university teacher educators was established. The grant is in its second year and was redesigned to meet the needs of a broader range of K-12 teachers, preservice teachers, and teacher educators.

Historical Context

The Virtual Learning Technology Community (VLTC) is a three-year project in which the goal is to establish and support a community of regional institutions actively engaged in using existing and emerging technologies to support learning by all members. The project includes several phases that are described below. In practice, the phases overlap, allowing for flexibility in establishing and supporting the community.

In Phase I, which coincided with the onset of year one of the project, activities focused on the identification of personnel, the definition of the roles and responsibilities of each member, and identification of the technology needs of teachers in the target region. Also during phase I, the project web site, was created to provide visitors (namely teachers targeted but potential interns as well), among other things, access to a listing of a range of technology related graduate course offerings and workshops of interest to the participants. The web site's URL is: *http://www.uwec.edu/academic/CI/vltc/vltc.htm* At the same time, teacher educators began identifying potential intern applicants to recommend to the respective schools for interviews, and purchasing the technology equipment necessary to support the interns.

In *Phase II* of the project, attention was directed toward the establishment of links between the VLTC and Regional institutions. At this stage, school sites where teachers were working with technology were identified. Interns were placed with two teachers so the teachers could be released to work on some technology innovations for their respective districts, schools, buildings, or classroom. The interns added some technical expertise, but were also working with the teachers to learn new ways to implement technology in their classrooms. At the same time, teachers, K-12 students, university students, and university educators were developing and participating in courses and workshops in preparation for year two. Those focused on topics such as Instructional Television (ITV and local networks), Computers in Education: On-line Communications and Information Retrieval, Information Literacy, Instructional Design and Development, Technology Gadgets, Creating Multimedia Productions, Distance Learning Networks, and Web Design.

Phase III involved strengthening links among the regional PK-12 schools. It extends and empowers the social context supporting the risks and growth associated with changing teaching and learning paradigms. Through a variety of mechanisms, VLTC participants will share their developing knowledge of current regional projects,

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establish communications, and publicize ongoing efforts. These avenues are important because they encourage participants to think about technology as a tool for learning subject matter rather than just learning about technology.

Phase IV will emphasize supporting new projects impacting students in VLTC schools and helping all projects become self-sustaining. Two new projects have emerged as the result of the existing VLTC activities. The Technology Mentors Project (described below) blends staff development in a single large district with opportunities developed for teachers in smaller schools. The Fast ForWord project will bring preservice students, teachers, and university researchers together to examine the efficacy of a web-supported reading remediation program.

Once fully established, the VLTC has a high probability of becoming self-sustaining as members develop shared projects and learn to rely on each other for support. VLTC will support participants' efforts to find new resources, disseminate new knowledge, and extend their expertise to additional PK-12 schools. VLTC will coordinate activities in which participants identify opportunities to continue to work together to develop new and spin-off projects that expand the impact on learners (e.g. parents of students in the K-12 schools, faculty instructors for student teachers and graduate students in the K-12 schools.)

Supporting Staff Development in Rural Schools through Virtual Communities

Affecting change in education requires a change in culture and the consideration of alternatives to the traditional in-service workshop model to teachers and more specifically to those in remote areas. A major goal of the VLTC is to develop distance learning models that are viable for teachers in remote sites. VLTC members have participated in activities ranging from face-to-face hands on workshops to web-supported curriculum design to full-motion distance education courses. The array of offerings included Instructional Television [as a teaching tool (27 teachers at 4 sites participated using the local network)], Computers in Education: On-line Communications and Information Retrieval, Information Literacy, Instructional Design and Development, Technology Gadgets, Creating Multimedia Productions, Distance Learning Networks, and Web Design. Alternative *delivery modalities* were also explored. Some workshops presented new technologies to the traditional audiences of teachers. Other workshops used traditional workshop formats with traditional audiences of teachers. Some workshops have had blended attendance of students, teacher, and teacher educator participants learning together using traditional workshop format and others with blended attendance using new technologies.

Teachers are putting new knowledge to work in their classrooms. For example, two second-grade teachers are collaborating to build a link between classes separated by 120 miles. They are using Nicenet and video-conferencing to foster an interchange of ideas among students and teachers. Each site's second grade students started by using the digital camera to take pictures of each other to send them to the other end via the web. This example illustrates the extension of the community of learners across schools, regions, and cultures. Additional activities stemming from VLTC supported interactions include the use of the Internet by middle school students to study the Arctic Challenge and first grade project using Distance Education help primary grades students meet their peers in another remote school district.

Through the experiences described above, the cadre of teachers guiding students' activities develop knowledge, skill, and confidence enabling them to serve as role models and support systems for others. Some will adopt other teachers and assume mentor roles. Others will continue developing their own projects to better understand ways in which technology is impacting students in their classrooms.

Emerging Virtual Community Activities

Some VLTC projects are long-term efforts to build new communication structures linking preservice teachers with mentors in the building, university supervisors, and peers in other schools. The *Video Conferencing Support for Student Teaching Project* is exploring the role of low-cost video-conferencing to increase supervision possibilities and to link student teachers in remote areas to their campus and to their classmates.

Four options for video conferencing are available to the VLTC constituents. They range from low-end (via Modem) to high end (complete Full Motion). One project is using low-end technologies; i.e. high speed modem, to visit student teaching interns in their classrooms at remote locations. Teacher educators use this medium in an attempt to save commute time and as a potential for opening up classroom doors when placement resources are limited. Real-life classroom examples and feedback from K-12 teachers brought into the teacher education classes have proved meaningful. However, connectivity has been an issue at times and participants have been actively working to remedial the problem and accommodate as best they can. A high-end project has been tested connecting two UW System schools at opposing ends of the state. The main issue with this option is the high cost.

The goal of the *Technology Mentors Project* is to use a multiplier model to establish a building-level support network within a single large district. Teachers with high levels of expertise "the Mentors" will help 2-4 additional teachers develop the expertise necessary to support remaining faculty. In year I (year 2 of the VLTC), six mentor teachers will be identified. The mentors will work with university and CESA staff on issues of adult learning, training models, leadership, team- building, and advanced technology issues. The mentors in turn will adopt two building-level teachers and work with them to enhance their technology skills, help them integrate curriculum and technologies, and prepare them to take on larger technology leadership roles in their respective buildings. In year II, each mentor and building teacher will "adopt" two more teachers and work with them using the same coaching and support model. The overall staff development effort will be supported by the preservice teaching interns assigned to the mentors. The interns will have advanced technological skills and will provide release time and additional support for the mentors and teachers. The activities of the Technology Mentors Project will intersect with other VLTC activities; thus some staff development will involve teachers from many VLTC project sites working together; other activities will emphasize one-on-one coaching.

It is anticipated that the multiplier model from the Technology Mentors Project along with teachers from the other projects contributing and collaborating across districts and regions will reduce the artificial boundaries to student teaching placements and collaboration amongst teachers. It is also expected that the projects that will emerge will be varied in nature and demonstrate creativity. The sharing of ideas and of technology equipment will become second nature to a seamless process.

Evaluation and Assessment

Evaluation of the VLTC focuses on (a) community development and (b) impact on participants. Community development evaluation examines the activities actually used to establish, and sustain the community. Impact evaluation tracks changes in participants' knowledge, skills, and classroom practices that result from VLTC-supported activities.

Community development evaluation maps the goals of phases I-IV against the activities designed to achieve that phase. Some of the activities are recurrent and/or continuous in nature and thus a decision of where best to place them in the table was agreed upon by the authors. (see table 1 below).

Goals	Activities Illustrating Different Phases	Current Assessment Processes
Phase I *Establishing Model*	Hiring of VLTC coordinator Monthly meetings at different sites Identification of K-12 potential schools	Expansion to other schools
Phase II *Establishing Links*	Creation of the VLTC Web site Identification of Teachers and Projects Distribution of pre-test survey	Maintenance of the VLTC web site Expansion and refinement of the sites
Phase III *Strengthening Links*	Placement of the interns and supervisors Provision of the technology tools Provision of professional staff development, workshops and inservices (27 teachers from 4 different schools)	Combination of the "intern fair" (Fall) with the technology intern boot-camp with BITS workshops Linkage of university supervisors in the Technology Mentors Project extension Increase the number of placements (Fall

		semester) New courses CI 495/695 Provide professional development workshops New internship opportunities
Phase IV *Supporting New Projects*	Establishment of the Technology Mentor Project extension Collaboration with local district for professional development plans Linkage to the Human Sciences and Services Study using the Fast ForWord software to determine efficacy for students with reading disabilities	Placement of Technology Mentors' Project interns "Distance" as continued problem in land of snow and ice

Table 1: The Impact of the VLTC on the Development of the Community

Project activities such as meetings, workshops taught by VLTC teachers, outreach activities, support and involvement by preservice teachers are documented and reviewed to identify contributions to building and maintaining the VLTC model. These collectively provide evidence that the model is generating changes in the ways teachers learn about technology, supporting increases in technology-appropriate practices, and increasing collaborative activities involving students, teachers, university educators, and CESA staff. As the VLTC community grows, assessment and evaluation efforts will continue documenting that development is occurring in appropriate ways.

New initiatives and concerns have emerged as a result of the activities developed at each phase. Those are briefly listed in column three of table 1 and will be summarized here. Expanding the model to other schools, districts, and regions is illustrated by the Technology Mentors Project. New internships have been created to involve additional communities in the Virtual Learning Technology Community. Critical issues in regard to placement have emerged: a) the quality of the experiences that are provided for our preservice teachers, and b) the number of placements at each site in order to maximize supervision. For example, an intern was hired to teach word-processing and keyboarding (low-level tasks) while the teacher worked with higher levels of technologies. In another case, a single placement at a distant location required the supervisor to drive further distances. Another drawback is attracting more interns to distant placements. Inclement weather (ice and snow in spring) is another drawback. Identifying new cooperating teachers with technology savvy, and developing new student teaching placements have alleviated some of the issues. Furthermore, clusters of interns and student teachers are being placed at distant sites to enhance supervisory efforts even though placements associated with the VLTC are further than 60 miles away from campus. The development of an internship fair with a technology boot-camp for those students that will be taking on a technology internship is being developed. Joining forces with already available university resources from Bringing Instructional Technology to Students (BITS) workshops, the project will be able to provide adequate "training" for preservice. Also, trying to involve more university supervisors in the Technology Mentors Project and other potential projects will help integrate a greater variety of technologies in the methods classes prior to the student teaching experience. Finally, a new course was designed that will be delivered using distance technologies to provide skills to K-12 teachers who will become cooperating teachers in these virtual community classrooms.

The impact of VLTC activities on participants is being tracked using pre-post surveys, small-group interviews, project artifacts, and workshop enrollment data. In the following table, items listed in Italics were identified as foci for the future of the VLTC

Populations Targeted	Documentation	1999-2000 *Focus*
K-12 students	Projects artifacts	*Small group interviews*
K-12 teachers	Survey pre/*post*	*Workshop enrollment data* *Small group interviews* (informal)
University students	*Exit interviews with VLTC Interns (survey)*	*Establishment of competencies*

University faculty	Survey pre/*post*	*Access for modeling* *Focus on classroom teaching* *Involvement of more teacher education faculty* *Curricular change*
UW-System	Proving it works symposia: Wisconsin Educational Technology Conference SITE 98 SITE 99	

Table 2: The Impact of the VLTC on the Different Populations Targeted

Data from a technology needs and practices survey is currently being compiled to build portraits of the knowledge, skills, and comfort levels for teachers in schools served by VLTC projects. In addition, artifacts from workshops, interviews, and classroom projects provide rich qualitative evidence of changes in teacher and student knowledge, classroom practices, and the interactions among curriculum, instruction, and assessment.

The technology needs and practices survey (Hollon and Hartfeldt, 1997) asks respondents to rate their knowledge, use, and student use of 55 technological tools and practices involving hardware, software, telecommunications, and networking resources. The survey also asks participants to rate their knowledge and confidence relative to the ISTE standards for teacher preparation.

Currently, data for 142 teachers are available. These data represent a partial set of pre-project responses. Detailed analyses are ongoing and will be reported separately. Items describing everyday hardware and technology (VCR, overhead projectors, personal computers) received highest ratings of knowledge and frequency of use by teachers. Respondents report much less knowledge about scanners, digital cameras, and image manipulation tools, and seldom require students to use them. Items related to subject specific software, problem-solving software, simulations, networking tools, and curriculum development received low ratings, with groupware, web-authoring software, and project management tools receiving the lowest ratings.

Of particular significance is the difference between teachers' uses of technological tools and their students' uses of those same tools. Our current analyses suggest that, even when teachers view themselves as knowledgeable and comfortable using common tools such as personal computers, word processors, and Internet resources, they use them much more often than they require their students to use them. For example, 82% of the respondents reported that they felt sufficiently knowledgeable about Internet resources to meet their own needs and/or teach uses of the Internet to others. Yet, only 36 % reported requiring students to use the Internet more than 5 times per semester. Such discrepancies need to be interpreted cautiously. Some discrepancies are not surprising; not all tools used by teachers translate directly into student use. Additional factors such as limited access to technology resources for students, limited curriculum-technology transformation, and inadequate staff development might account for other gaps in use. Overall, though, the data clearly show that teachers are using technology much more than they require students to use it. .

Most survey respondents report that the ISTE standards (ISTE, 1997) are very important goals for preservice teachers; only one standard (of thirteen) related to research and development of appropriate assessment practices was rated as important or very important by less than 90 per cent of the respondents. In contrast, most teachers felt unprepared to help students meet the standards. Only five of the thirteen standards were rated by at least 50 per cent of the respondents as items they felt prepared to help students achieve.

The survey data provide only one view of teacher and student uses of technology. As VLTC projects develop, we hope to see increases in the numbers and types of items rated in the knowledgeable/confident category, fewer items rated as unfamiliar, and smaller discrepancies between teachers and students' uses of the same technological tools.

Analyses of other data continue. Artifacts from workshops show a rich array of products ranging from web sites to communications centers to Internet-supported content instruction. Teachers are quickly developing skill

in using distance education technologies. Barriers between students and teachers are tumbling as comfort levels increase. Student experts are working in formal and informal capacities through web design, coaching peers, offering support and assistance to building teachers, and sharing ideas over the Internet. In short, the community is healthy and growing.

Summary

The process of establishing different phases of developing the VLTC proved effective in that it has opened up lines of communications at different levels. Technology is a "great leveler" as the different constituents of the VLTC work together in the context of changing knowledge and emerging technologies. In this model, K-12 students and teachers and university students and teachers can learn together. Collegial conversations and learning grew directly from teachers' experiences with their students. Teachers ranged from novices with technology to using it to modify their instructional methods. More data is being compiled as we look onto year three of this project.